



**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

*WT*

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/294,137 04/20/99 MAEDA

S 500.37149X00

020457 WM31/1011  
ANTONELLI TERRY STOUT AND KRAUS  
SUITE 1800  
1300 NORTH SEVENTEENTH STREET  
ARLINGTON VA 22209

EXAMINER
----------

WERNER, B ART UNIT	PAPER NUMBER
-----------------------	--------------

2621  
DATE MAILED:

*7*  
10/11/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/294,137

Applicant(s)

MAEDA ET AL.

Examiner

Brian P. Werner

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 July 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 13 July 1999 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) filed with the application has been received and considered. While not presented on the customary form 1449, the IDS does meet the requirements of MPEP paragraph 609 (i.e., a document listing is provided on a separate sheet, and the specification discusses the relevance of each foreign language document). An initialed copy is provided herewith.

### ***Drawings***

3. The corrected or substitute drawing (figure 24) was received on July 13, 1999. These corrected drawings are acceptable.
4. Figures 1-6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). These figures are discussed in relation to the prior art in the "background" section of the specification, at pages 1-6.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 14 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 14 lacks an antecedent basis in claim 8 for "said correction of brightness values". Claim 14 will be assumed to depend from claim 11, which does recite a correction of brightness values. Claim 25 lacks an antecedent basis in claim 22 for "said alignment means". Claim 25 will be assumed to depend from claim 24 which does recite an alignment means.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

8. Claims 15, 16, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Wihl (US 4,633,504).

Regarding claim 15, Wihl discloses an apparatus for inspecting defects of patterns (figure 2), comprising:

Art Unit: 2621

image pick-up means (figure 2, numerals 42-50 are the components of the image pick-up means) picking up first and second images of patterns on a substrate that naturally have the same shape ("two die images" at column 4, line 57, on substrate 12; these dies, which have "small features [patterns] that must be inspected" at column 3, line 67, are designed to have the same shape and thus are compared with each other to detect differences, which are defects as described below);

means for storing the first and second images (figure 2, numerals 54 and 56; specifically, both numerals 54 and 56 have a receiver 110 and a buffer 112 which initially stores the image data as depicted in detail at figure 4);

brightness conversion means for converting the brightness of any one of the first and second stored images (figure 4, elements 114-131 are a brightness conversion means; these elements are a "filter that produces a corrected pixel of output as the weighted sum of each pixel of input and its nearest 48 neighbors" at column 2, line 52; thus, the brightness of each pixel is converted to a "corrected" value; both images are corrected by numerals 54 and 56 in figure 2, respectively);

defect detection means comparing the first and second images (figure 2, numeral 64) at least any one of which is converted in brightness (both are converted, or "corrected" in brightness) thereby detecting defects of the patterns ("[t]he data stored in the respective memories is subsequently compared by a defect analyzer 64 to provide defect detection signals" at column 4, line 53); and

output means for producing information of the defects ("output for storage" at column 4, line 65).

Regarding claim 16, the brightness conversion means locally converts the gradation of the images (a "7X7 array" is converted at one time at column 5, line 16 and 44).

Regarding claim 18, the image pick-up means is optical ("optically inspecting" at column 3, line 66).

Regarding claim 20, an output means displays on a screen the information of brightness of the images ("visual display of the inspected die" at column 4, line 67; both dies are inspected, and the operator can view either; a visual display of the actual die is a display of the brightness information of that die).

9. Claims 1, 4, 8-14 and 22-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al. (US 5,808,735).

Regarding claims 1 and 8, Lee discloses a method and corresponding apparatus (figure 1) comprising performing the steps of:

comparing a first image produced by picking up a first pattern formed on a substrate and a second image produced by picking up a second pattern formed on the same substrate (images are picked-up from a "semiconductor substrate" having circuit patterns at column 3, line 30, using the optical system of figure 1; the first image is a "reference image" and the second a "test image" at column 4, lines 18-19; "The reference image may be a previously stored data-base image of a corresponding known-good area of the same or a similar die on the same ... wafer, or it may be a specific image taken from ... an adjacent die" at column 2, line 35, and thus both

Art Unit: 2621

patterns are on the same substrate; the image are compared; see “the intensity values ... of corresponding test and reference images are compared pixel-by-pixel” at column 6, line 43), the second pattern having naturally the same shape as the first pattern (“Images of defect-free areas of the test surface should be very similar to images of corresponding areas of the reference surface” at column 6, line 13; thus, the two have naturally the same shape), thereby extracting proposed defects (“potential defects” at column 7, line 35), and obtaining information of the certainty of the extracted proposed defects (“how far each potential defect is from the [test] image center” at column 7, line 59 is information regarding the certainty of the potential defect; this is because “Defects are more likely to occur in the center” at column 7, line 51, and a “radius is defined within which the defect is almost certain to reside” at column 7, line 45; following this, the distance of the defect is then subtracted from the radius to obtained the distance of the defect from the center of the test image at column 7, line 58, and the “difference values” are “multiplied by a weighting factor” which “favors potential defects that occur near the center of the test image” at column 7, lines 60-64; thus, the certainty of a defect is related to the location of the defect from the center; and the location of the defect is based on the comparison step);

detecting a true defect from the extracted proposed defects (first, the system “selects the potential defect having the greatest base area” at column 8, line 48, and then “classifies a defect by comparing the defect's defect-parameter vector” with stored vectors at column 9, line 15, and then “identifies the type of defect” at column 9, line 19); and

producing information of the detected true defect ("identifies the type of defect" at column 9, line 19; also, the system "estimates the degree of confidence in the classification based on the precision of the defect-parameter vector match" at column 9, line 20 which is also information of the defect).

Regarding claim 9, the certainty information (i.e., "how far each potential defect is from the [test] image center" at column 7, line 59) of the defects is formed of a degree of inconsistency between the first and second images resulting from the comparison (after comparing at column 6, line 44, the "defect array D" is filtered at column 6, line 57 and "clustered" at column 7, line 24; then, the certainty information is calculated from the filtered and clustered defects at column 7, lines 50-64 as described above) and a reliability of the degree of inconsistency (the "radius" at column 7, line 54, which is used to determine the certainty information [i.e., "how far each potential defect is from the [test] image center" at column 7, line 59], depends on "the position accuracy of the translation stage 70" at column 7, line 53, and this accuracy is an indication of the reliability of comparison [the higher the accuracy of the stage, the more reliable the comparison]; thus, the certainty information, which is calculated based on the radius, indirectly depends on the reliability of the comparison).

Regarding claims 10 and 23, the certainty information (i.e., "how far each potential defect is from the [test] image center" at column 7, line 59) is based on the brightness of each of the first and second images (i.e., the certainty information is based on the location of the defect, and the location of the defect is based on the comparison of pixel values of the first and second images at column 6, line 44, and the pixel values



Art Unit: 2621

indicate the brightness of the image; see "intensity differences between corresponding test and reference pixels" at column 5, line 56).

Regarding claim 11, the detecting step includes storing the images (the images are processed by, and thus stored in the workstation of figure 1, numeral 30), aligning the images ("the test and reference images are aligned" at column 6, line 21), correcting the brightness values of the aligned images ("normalized for intensity" at column 6, line 42; as described at column 6, lines 30-33, the intensity values of the images are made to correspond more closely with one-another, or corrected with respect to one-another, based on a histogram of differences), and a step of comparing the corrected brightness values to detect defects ("Once the test and reference images are aligned in dimensions and normalized for intensity, the intensity values ... of corresponding test and reference images are compared pixel-by-pixel" at column 6, line 41).

Regarding claims 12 and 25, the alignment is performed for each pixel (the entire images are aligned as described immediately above; given that the images are made up of pixels [i.e., a "single x-y location corresponding to both" the test and reference images at column 5, line 36], then each of the pixels are aligned; a single pixel meets the claimed requirements for a "small division" as claimed in claim 25).

Regarding claims 14 and 26, the correction of brightness (brightness is an image gradation) values is performed for each local area, or part (the intensity values of each pixel are corrected in order that the images correspond in brightness to one-another; see "offsetting the intensity values of each reference pixel" at column 6, line 32; a pixel is a local area, or part of an image as claimed).

Art Unit: 2621

Regarding claims 4 and 13, the substrate is a semiconductor wafer ("wafer" at column 1, line 51) covered with a flat, optically transparent film (a semiconductor wafer is covered by many layers of film, which are "separately analyzed" at column 3, line 35; see "different layers of a given surface are typically of different types of materials ... [which] may be layers of pure silicon, silicon dioxide, metals, or photoresist" at column 4, lines 10-14; the "photoresist" meets this limitation as photoresist is a uniform, or flat, transparent film that covers the wafer).

Regarding claim 22, Lee discloses an apparatus comprising means for performing the image pick-up, proposed-defect extracting, defect detecting and output functions as described in the rejection of claim 8 above (the details of which will not be repeated here). Further regarding claim 22, Lee discloses a table means (figure 1, numeral 70) on which the substrate is placed (figure 1, numeral 80) and can be moved in an x-y plane ("x-y-z translation stage" at column 4, line 23) and where the pick-up means picks up the patterns placed on the table which is continuously moved (images of specific "x-y" scans [column 4, line 65] are picked up for "a number of locations along the z axis" at column 4, line 66; the z axis is controlled by the "x-y-z translation stage" at column 4, line 23).

Regarding claim 24, the Lee system further comprises means for storing the pattern images (the images are processed by, and thus stored in the workstation of figure 1, numeral 30), means for aligning the images ("the test and reference images are aligned" at column 6, line 21; again, the process is performed by a software means in the computer), and means for correcting the gradations of the aligned images

Art Unit: 2621

("normalized for intensity" at column 6, line 42; as described at column 6, lines 30-33, the intensity values of the images are made to correspond more closely with one-another, and are corrected with respect to each other, based on a histogram of differences; intensity values, or pixel values are gradations of the images), and where the proposed defects and certainty estimates are extracted from the gradation corrected images ("Once the test and reference images are aligned in dimensions and normalized for intensity, the intensity values ... of corresponding test and reference images are compared pixel-by-pixel" at column 6, line 41 from which the "potential defects" at column 7, line 35 and certainty at column 7, line 58 [i.e., the distance as described above] are extracted).

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 1, 3, 5, 7, 15, 21 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebeau (US 5,204,910) in view of Kobayashi et al. (US 4,669,123).

Regarding claims 1, 7, 15, 27 and 28, Lebeau discloses a method comprising:  
picking up and storing images of first and second patterns formed on a substrate, where the second pattern has naturally the same shape as the first ("two images" at column 3, line 55 are stored in "computer memory" at line 36; a first image is an "image

Art Unit: 2621

of a defect free workpiece which is used as a standard of comparison for inspection" at column 2, line 50 and a second image is a "run image ... of a workpiece being inspected" at column 2, line 52; regarding the claimed substrate, the image are of patterns formed on a "semiconductor wafer" at column 3, line 11; regarding the second pattern as having naturally the same shape as the first, the second and first patterns being compared for inspection have the same natural shape except in areas where a defect occurs – which is unnatural);

correcting at least one of the images to match the brightness of the other (the graylevels of the "[r]un image ... are then mapped based on a comparison of the mean brightness of the taught image to that of the run image" so "the mean brightness level ... is the same as the mean value of taught image" at column 5, lines 50-54); and

comparing the images matched in brightness to detect a defect ("compared by algebraically subtracting the respective graylevel values at each pixel location" at column 6, line 56; "bright defects" and "dark defects" are detected at column 7, line 24).

Regarding claim 3, Lebeau teaches local gradation conversion (this limitation is met in either of two ways: first, see "decreasing values of graylevels" at column 6, line 25; the graylevel of each, individual pixel is converted and thus the conversion is local – to the pixel; second, the conversion process begins with a step of registration, where local areas corresponding to bright and dark spots are dilated and eroded as depicted in figures 2-5; and this dilation and erosion is a local process).

Regarding claims 5 and 29, the images are picked-up optically ("video camera" at column 3, line 50).

Regarding claims 15 and 27 specifically, the limitations recited therein are met by Lebeau as described in the claim 1 rejection above. Lebeau discloses an "apparatus" for performing the disclosed method ("computer" at column 3, line 36 and "digital hardware" at line 46) and an output means producing defect information ("recording locations of bright defects 56 and dark defects 54 for later analysis" at column 7, line 24). Regarding claim 27, Lebeau compares the first and second images to detect defects ("compared" at column 6, line 56) and then estimates information of the detected defects (a "bright threshold" and a "dark threshold" are set for extracting bright and dark peaks extending beyond them as seen in figure 11, and described at column 7, line 1; these thresholds are "determined experimentally" as described at column 7, line 5, and are thus estimated).

Regarding claim 21, Lebeau discloses means for correcting a positional shift between the images ("registered" and "rotation and spatial position" at column 3, line 60; registration of spatial position involves the positional shifting of the images with respect to each other) with pixel unit accuracy ("It is impractical to register two images to the accuracy of less than a single pixel" at column 3, line 61; thus, the images are registered to an accuracy of a single pixel), and the brightness conversion means converts the brightness of the shifted image (first, the images are "registered" at column 3, lines 57+ and then the brightness is corrected at column 5, lines 20+).

Regarding each of the above claims, while Lebeau discloses the comparison of images of patterns in two images (i.e., the defect free taught image and the run image),

Art Unit: 2621

Lebeau does not teach the image of the second pattern being formed on the same substrate as the first.

Kobayashi discloses a system in the same field of semiconductor defect inspection ("inspecting method and apparatus" and "semiconductor device" at column 1, line 7), wherein Kobayashi teaches comparing images of first and second patterns picked-up from the same substrate ("pattern comparing method one unit pattern is compared with another unit pattern having the same shape and size" at column 1, line 23). Kobayashi describes how the traditional "database comparing method requires a lot of inspecting time and covers a lot of design data" (column 1, line 27) and that "the pattern comparing method is preferable to the database comparing method for inspection of complex photomask patterns" (column 1, line 29).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Lebeau system by picking up both the taught and run images from the same substrate as taught by Kobayashi, thus realizing the benefits of the pattern comparing method taught by Kobayashi including the reduction of inspection time when inspecting the complex patterns of a semiconductor device, and eliminating the need to process and store a reference for comparison (as the normally identical semiconductor devices on a wafer are compared with each other).

Regarding claims 7 and 27 specifically, while Lebeau teaches "recording locations of bright defects 56 and dark defects 54 for later analysis" at column 7, line 24, Lebeau does not specifically teach displaying the detected defects and the information of features of the detected defects on a screen.

Art Unit: 2621

Kobayashi teaches displaying the detected defects and information of features of the detected defects on a screen ("human inspector can check the inspection results by observing the stored data in the stage coordinate memory 300 on the inspection output device 400 such as a cathode-ray tube" at column 4, line 12; the features include "the stage position at which there is a defect" at line 5; thus, given that each defect detected is output to the operator on a CRT, the defects are displayed; that the claim does not require any particular form of visual display, only that the defects are displayed; also, given that the coordinates of where the defect exists are displayed, information about the defects is displayed).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to display the detected defects and information of detected defect features on a screen in the Lebeau method, as taught by Kobayashi, in order to allow a human operator to immediately and visually review and analyze the results of inspection and thus take immediate action, or make decisions regarding the inspected semiconductor under inspection.

12. Claims 6, 19 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebeau (US 5,204,910) and Kobayashi et al. (US 4,669,123) as applied to claims 1, 15 and 27 above, and further in view of Wagner et al. (US 5,659,172).

Regarding claims 6, 19 and 30, Lebeau does not disclose picking up the first and second images using an electron beam.

Wagner discloses a system in the same field of endeavor of semiconductor wafer inspection ("detection of defects on semiconductor wafers" at column 1, line 11), comprising picking up images to be inspected using an electron beam (figure 1, numeral 32; see "SEM 22 electron beam 32" at column 4, line 64; "images of an area of the semiconductor wafer which is to be inspected" at column 3, line 2).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize an electron beam scanner as taught by Wagner, as the image pick-up source of the Lebeau system, in order to detect defects the size of which "falls below the resolution of conventional light optics" (Wagner, column 1, line 43) because of the scanning microscope's ability to resolve "features more that an order of magnitude smaller than the wavelength of visible light" (Wagner, column 1, line 51), thereby improving defect detection sensitivity and thus accuracy.

13. Claims 2 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lebeau (US 5,204,910) and Kobayashi et al. (US 4,669,123) as applied to claims 1 and 15 above, and further in view of Haskell et al. (US 6,111,596) .

Lebeau discloses an adjustment of the two images "so that their overall brightness is the same" as described at column 5, line 20. While Lebeau describes one embodiment that compares "the mean brightness level of the two images" at column 5, line 25, Lebeau does not teach a linear conversion of the gain and offset so that the brightness of the images can be made equal. Lebeau states that "[o]ther embodiments use techniques such as ... video amplifier gain ... to match the brightness of the



Art Unit: 2621

representations of the images" at column 5, line 25. Lebeau is not limited to any one method.

Haskell discloses an image process system in the same field of endeavor of adjusting the two images so that their overall brightness is the same ("mismatch in brightness and/or color balance between the two views of a scene due to differences in imaging parameters is rectified" at column 4, line 15), comprising matching the brightness of two images by means of a linear conversion of gain and offset ("gain and offset differences not only for luminance but also for chrominance are corrected" at column 4, line 13; specifically, see "Method 1" at column 6, line 20; "gain and offset values that must be applied to the right-view image to correct for mismatch can be obtained by solving two simultaneous equations" at column 6, line 34; the equation for gain, "a", is at column 6, line 47 and offset, "b" at line 43; the equations are linear [i.e., not exponential] and thus the correction is linear). The technique of method 1 is best applied to "images having histograms with at least two uniquely identifiable points with ... 'very dark' and 'very bright' contents" as described at column 6, line 21, and this is exactly the situation with Lebeau (see figures 7-9).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to match the brightness of the Lebeau images by using a linear conversion of gain and offset as taught by Haskell, in order to more accurately correct for image brightness difference by factoring in both gain and offset, as opposed to just a simple histogram shift as is currently disclosed by Lebeau (see figures 8 and 9 which depict a simple histogram shift), and to provide the additional benefit of correcting a

Art Unit: 2621

chrominance mismatch (in addition to the luminance, or brightness) thereby providing Lebeau the ability to utilize color images, to more accurately represent the semiconductor under inspection.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shafer et al. (US 6,133,576) is pertinent as teaching that "[p]hotoresist is a material that is transparent to visible light" at column 10, line 24). Worster et al. (US 5,963,314) is pertinent as being incorporated by reference into the Lee et al. reference (US 5,808,735, column 5, line 40), and describing how the stage of the confocal microscope is continuously moved during the image pick-up (column 11, lines 25 and 50, and column 12, line 32).

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 703-306-3037. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on 703-305-4706. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Art Unit: 2621

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Brian Werner  
Patent Examiner  
October 4, 2001



**Brian P. Werner**  
**Patent Examiner**  
**Art Unit 2621**